

Plants, Animals, and Wetlands

This section summarizes information provided in the following reports:

- City of Redmond, 1995a. *Comprehensive Plan Final Environmental Impact Statement*, prepared by City of Redmond Department of Planning and Community Development.
- Parametrix, Inc., 1998. *160th Avenue NE Supplemental Environmental Impact Statement*, prepared for the City of Redmond Department of Planning and Community Development.
- Norman Wildlife Consulting (NWC), 2003. *The Town Center Heron Colony in Redmond and Review of Expansion of Bear Creek Parkway*, prepared for the City of Redmond Department of Planning and Community Development.

A Biological Assessment, if required for compliance with Section 7 of the Endangered Species Act and/or for permitting reasons, will be prepared after the selection of a preferred alternative. A Biological Assessment is the process by which the project area is studied to determine if threatened or endangered species or their habitat will be affected by the proposed project.

The project area will be surveyed prior to construction to determine:

- The number and size of trees to be affected. The CDG specifies that Landmark trees (greater than 30" in diameter) shall not be removed unless an exception is granted. Significant trees (between 6" and 30" in diameter) must be replaced at a 1:1 ratio.
- The presence of raptor and/or migratory birds and/or nests in the project area.

Affected Environment

Several agencies provided information on threatened and endangered species, including the Washington Department of Natural Resources (WDNR) and the Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) database. This also included biological resource reports written for other projects near the Bear Creek Parkway Extension (City of Redmond, 1995a; Parametrix, 1998; and NWC, 2003).

Plants

In its native state, the project area's predominant vegetation community was coniferous forests of Douglas Fir, Western Hemlock, and Western Red Cedar with surrounding areas of shrub and herbaceous vegetation. Currently, a coniferous forest (CF) is located north and south of Leary Way at the Leary Way/Bear Creek Parkway intersection (see Figure 3.3). The dominant tree species at this site is Douglas fir, with lesser numbers of big-leaf maple and limited alders, cedars, and cottonwoods. Canopy cover ranges from 60 to 90 percent closure in this area. A mixed forest area is located west of the Leary Way/159th Place NE intersection. The canopy cover range is approximately 25 percent closure in this area. Coniferous forest dominates the overstory of these two areas with the typical understory of

northwest lowland Douglas fir forests, but there is also a large amount of non-native English ivy and Himalayan blackberry (NWC, 2003). While the exact sizes and numbers of trees are not known, the coniferous forest areas likely contain numerous Significant and perhaps Landmark trees.

At this location, herons have only nested in Douglas fir (NWC, 2003). The RTC Heron Colony (WDFW PHS #344-1) is discussed further in the following *Animals* section.

The WDNR currently has no records within the Natural Heritage Information System for rare plants, high-quality native wetland, or high-quality native plant communities near the Redmond planning area, which includes the project area (Redmond, 1994). This information is consistent with project area conditions at the time of field review.

Although a limited area of upland forest remains in the project area, deciduous species including red alder, big leaf maple, black cottonwood, and a variety of native berries are located along the boundaries of large areas of disturbed grassland/shrub communities. These communities are located south of Leary Way between the Sammamish River and Bear Creek Parkway. The disturbed grassland/shrub habitat primarily consists of non-native grassland and shrub-upland habitat that is the result of an abandoned golf course. Disturbed grassland/shrub area continues north along the upland areas east of the Sammamish River before reaching Redmond Way.





Animals

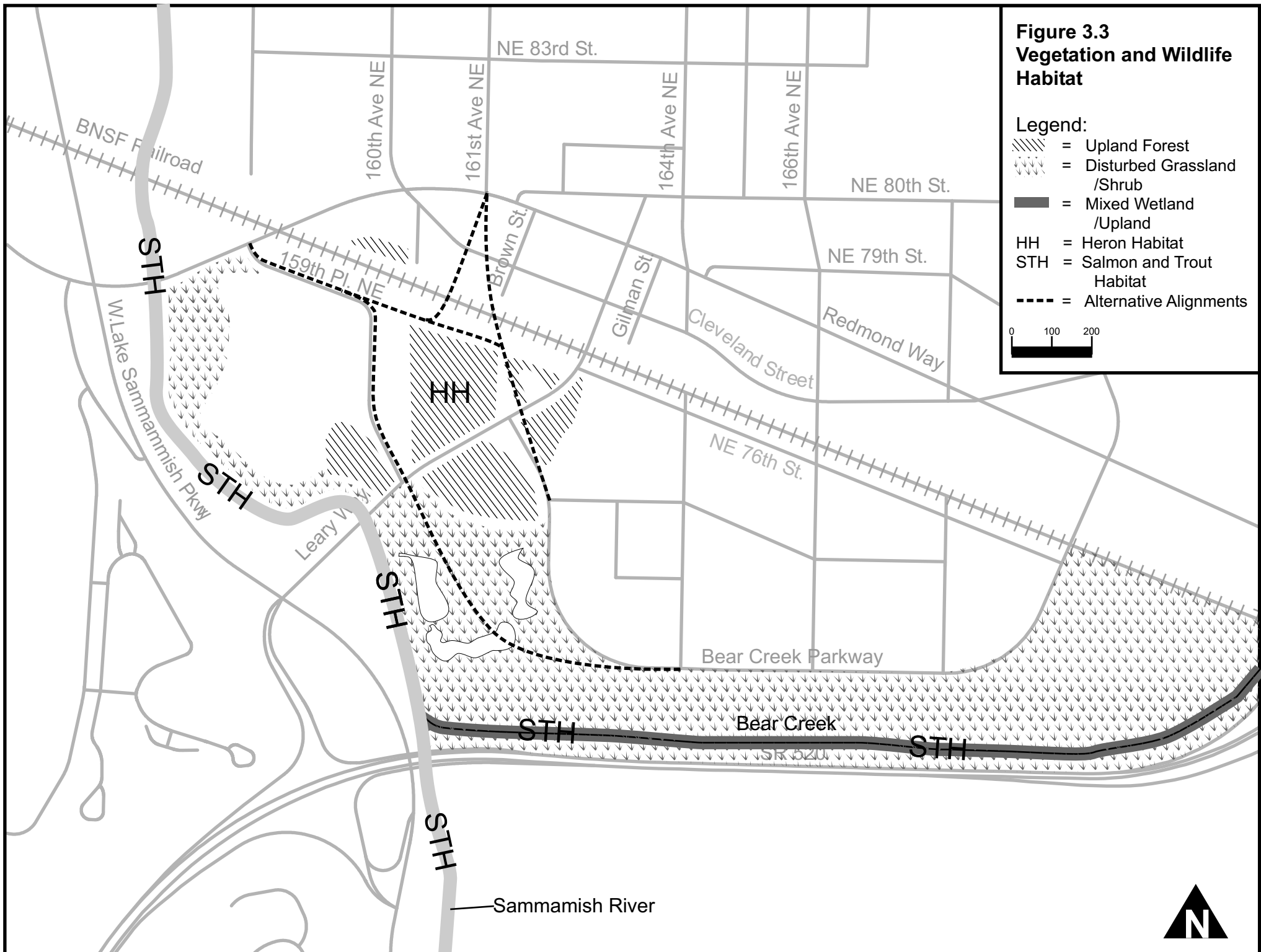
Human settlement defines much of the Bear Creek Parkway Extension project area. Although this area is highly developed, it supports a variety of fish and wildlife. Large mammals such as black bear, mule deer, cougar, bobcat, porcupine, beaver, and river otter were common to the area before human settlement. Habitats for these animals have been substantially or entirely eliminated. Coyotes, raccoons, weasels, striped skunks, muskrats, and snowshoe rabbits still inhabit peripheral areas around population centers. Small mammals including squirrels, rats, mice, voles, shrews, and moles commonly reside in area forests, pastures, and stream banks (City of Redmond, 1995a).

The WDFW has created the PHS program to maintain the state's wildlife heritage. The program lists priority habitats and species, maps their location, and recommends techniques to reduce the impacts of land use changes on them. A priority habitat is one that has unique or significant value to many species, and may have one or more of the following characteristics: comparatively high wildlife density and diversity, important wildlife breeding grounds, important wildlife movement corridors, limited availability, high vulnerability to habitat alternation, and unique or dependent species. Ultimately, this information is to be used by communities to prevent wildlife species from becoming increasingly imperiled (City of Redmond, 1995a).

Figure 3.3
Vegetation and Wildlife
Habitat

Legend:

-  = Upland Forest
-  = Disturbed Grassland /Shrub
-  = Mixed Wetland /Upland
- HH = Heron Habitat
- STH = Salmon and Trout Habitat
-  = Alternative Alignments



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The PHS list includes species officially listed as “state or federal endangered, threatened, sensitive, or candidate.” Listed species require protective measures for their perpetuation due to their limited population status, sensitivity to habitat alteration, and/or recreational importance. Priority species found in the area surrounding the project area include bald eagle, blue heron, purple martin, osprey, Western pond turtle, and bullhead trout (City of Redmond, 1995a). The Puget Sound chinook salmon (threatened) and the Puget Sound coho salmon (candidate) may also occur within or near the project area (National Marine Fisheries Service, 2002). Priority habitats found in the project area include the Sammamish River and Bear Creek (City of Redmond, 1995a).

Although not considered priority habitats, the areas of disturbed grasslands/shrub in the project vicinity provide habitat and serve as foraging areas. Songbirds, deer, small mammals, and amphibians may use these areas in association with the nearby ponds, waterways, and forested habitats.

Hérons

The area of coniferous forest north of Leary Way (formerly known as the Winmar Property, now owned by the City of Redmond) provides habitat for Great Blue Heron. The information and references included in this section were provided in the *Town Center Heron Colony in Redmond and Review of Expansion of Bear Creek Parkway*, (NWC, 2003). This report is included in Appendix B.

The Redmond Heron Colony has varied in size since its first reported nesting in 1997 of seven nests. In 2000, 25 nests were identified. In 2003, seven nests were reported with an average of well over two young per successful nest. The herons appear to be nesting every year in the southeast corner of the forest, close to the Workshop Tavern and the former (also now City-owned) King County maintenance facility. Previous studies have observed the heron colony nesting in the southwest and generally on the western side of the site (NWC, 2003).

Great blue herons can be vulnerable because of their tendency to aggregate during the breeding season. The availability of suitable great blue heron breeding habitat is declining as human population increases in Washington State. In addition, great blue herons may abandon breeding colonies or experience reduced reproductive success when disturbed by humans (Quinn and Milner 1999). There are; however, differences in sensitivity between herons at different colonies, and also differences within a colony over the nesting period.

In King and Kitsap counties, Jensen (unpublished data) found that great blue heron colony size decreased as distance to the nearest human disturbance within 300 m (984 ft) decreased, and as the amount of human development within 300 m (984 ft) of the colony increased. Nests occupied first in each of 3 King County colonies in 1991 were furthest from development and had more than twice as many fledgling than nests closer to development (3.13 versus 1.51 young/nest) (Jensen unpublished data, cited in Quinn and Milner 1999). Other studies suggested that great blue herons may habituate to non-threatening repeated activities (Webb and Forbes 1982, Vos et al. 1985, Calambokidis et al. 1985, Shipe and Scott 1981). Thus, different great blue herons may have different tolerance levels to disturbance depending on disturbance history and type (Simpson 1984). Although the effects of

visual and auditory buffers have not been well studied, topographic or vegetation obstructions may ameliorate some types of disturbance (Webb and Forbes 1982).

The most sensitive period during nesting is the early portion of the season, prior to incubation. In planning development projects, it is critical to differentiate between herons that move close to development and developments that encroach on a colony. For colonies not adapted to disturbance, inappropriately timed construction activity can cause abandonment of the site. Some colonies associated with freshwater sites may return early in January, and others on saltwater sites may not return to the colony site until April (NWC, 2003).

Colonies are typically empty by late summer, though some locations may have late nesting chicks in the nests until September. Evidence shows that late nests are less productive, and even herons that do successfully fledge from late nests do not have enough time to learn to forage by winter and are much less likely to survive (NWC, 2003).

Guidelines for protecting herons from disturbance focus on the nesting colonies and are regulated by the City of Redmond's Sensitive Area Ordinances (CDG 20D.140). The typical reasons for colony abandonment include excessive and sudden disturbances close to the colony, loss of buffer area, and entrance into the colony (especially early in the nesting season).

Hérons are classified as a Priority Species under the Growth Management Act, and the WDFW has made recommendations to protect them from disturbance, including a recent recommendation that open areas and wetlands be protected near heron colonies (Quinn and Milner, 1999). This protection primarily focuses on nesting areas defined as "critical habitat" in the Sensitive Areas Ordinance for the City of Redmond (20D.140.10-070). Critical habitat specifically includes heron rookeries and raptor nesting trees. The City does not provide specific recommendations for the size of buffers for heron colonies, but does specify that these buffers should consider WDFW recommendations and those of qualified consultants. Recommendations for buffer zones around heron colonies vary from 50 to 250 meters (Carney and Sydeman 1999). The WDFW recommends the establishment of permanent, year-round minimum protection areas (buffers) of 250-300 m (820-984 ft) from the peripheries of colonies (Bowman and Siderius 1984, Quebec 1986 *in* Kelsall 1989, Vos et al. 1985, Buckley and Buckley 1976, Pullin 1988, Short and Cooper 1985, Parker 1980). WDFW recommends restricting human activities likely to cause colony abandonment in this buffer year-round. All human activities likely to cause disturbance (flushing and other behaviors that may reduce fitness) to nesting great blue herons are recommended to be restricted in this buffer area from the beginning of courtship behavior through fledging (15 February to 31 July) unless site specific nesting chronology is known, in which case timing of restrictions should reflect this knowledge. In addition, the WDFW concurs with Butler's (1991) recommendation that activities such as logging or construction should not occur within 1,000 m (3,281 ft) of a colony and no aircraft should fly within a vertical distance of 650 m (2,133 ft) during the nesting season unless those activities can be shown to have no effect on great blue heron fitness.

The King County Comprehensive Plan identifies a special district overlay to protect heron habitat (21A.38.210). This overlay specifies a 660-foot (200-meter) buffer area around heron rookeries.

At the Redmond colony there is already disturbance from existing traffic on Leary Way. Existing nests are located within approximately 100 feet of the roadway, and at this location the road noise does not appear to have any impact (NWC, 2003). In 2003, major construction occurred at RTC, including a large crane, which had no apparent impact on the heron colony at a distance of 750 feet. It is important to note that the close proximity of the Redmond heron colony to locations of human activity is a result of the herons' choice to nest in this location, and that alternative suitable trees are available further from the roadway (and have been used by the colony in the past).

The prime issues of concern in the proposed alternatives relate to how the herons will respond to:

- New disturbance from the construction activity
- Changed habitat near the nests
- Changed traffic levels, presumed to be louder, in some alternatives

Hérons, like most birds, are also protected under the Migratory Bird Treaty Act. This Act states that no birds can be taken or killed, including active nests. Locations with nests can be destroyed or removed outside the nesting season, as long as the appropriate authorities are notified, and other laws are being followed. In the case of the Redmond heron colony, it is not anticipated that nest trees will be removed, since there will be no disturbance in the area of known nests. However, it is possible that nests will be identified in trees to be removed. Because there is evidence that many other suitable trees are available, that herons have nested in many other trees in the past, and that trees would be removed outside the nesting season, removal of inactive nests would not violate the Migratory Bird Treaty Act.

Fish and Endangered Species

The Sammamish River and Bear Creek provide an important migratory route for salmonids and other anadromous fish. The Sammamish River is located on the western edge of the project area. Bear Creek is located approximately 200 feet south of the southern project area limits.

Bear Creek and the Sammamish River constitute important salmon spawning and juvenile rearing habitats within the Lake Washington/Lake Sammamish system. Large numbers of coho and moderate numbers of chinook and sockeye salmon use these watercourses annually. The salmon populations contribute to sport and commercial fisheries in Puget Sound and the Pacific Ocean (Redmond, 1994). However, the existing vegetation consisting primarily of blackberry brambles, is not ideal salmonid habitat. Part of the City's ongoing "Riverwalk" project (see Recreation section, below), is to reestablish native riverine wildlife habitat along the Sammamish River, including nesting and foraging sites using native trees, understory shrubs and grasses. Planting of larger shade trees will improve salmon habitat.

Resident and anadromous game fish that inhabit the waters of the area include: steelhead, rainbow, cutthroat, and bullhead trout. Peak populations of searun cutthroat and steelhead are present in the area during August and September. The State intensely manages the streams for resident and anadromous fisheries. Annual plants of legal-size rainbow trout supplement native populations (Redmond, 1994).

The federal government recognizes three categories of listed plant and animal species: Threatened and Endangered, Proposed, and Candidate. Proposed species are Candidate species for which the listing process has been initiated but a decision on listing is pending. Federal Candidate species may warrant listing but have not undergone the listing process. Two listed species and one Candidate species were identified as possibly occurring within or near the project area: the Puget Sound chinook salmon (threatened), the bull trout (threatened), and the Puget Sound coho salmon (candidate) (NMFS, 2002).

Salmon production habitats can be adversely affected by the following (Redmond, 1994):

- Excessive removal of water from salmon streams;
- Change in the natural temperature or physical and chemical balances of the water through discharges of domestic or industrial effluents;
- Alteration of natural stream beds or stream banks, leading to reduced spawning area, food production habitat and necessary protective cover; and
- Placement of physical barriers (e.g., screens, diversions, or culverts) in the natural migration path of either the adult spawning salmon or the juvenile seaward-migrating progeny.

Wetlands

The CDG Sensitive Areas Map for wetlands locates a mixed wetland/upland area south of the existing Bear Creek Parkway alignment. This map is based on the National Wetlands Inventory and hydric soils from the Natural Resource Conservation Service Soil Survey. Actual field conditions may be different than mapped. A detailed wetland survey and delineation (if necessary for permitting purposes) will be completed upon selection of a preferred alternative. Preliminary field review identified the location of the mapped mixed wetland/upland area as approximately 200 feet south of the Bear Creek Parkway Extension project area. No wetlands were identified within the proposed alternative alignments. Wetland buffers existing outside the project area would not be affected by the proposed alternative alignments.

An area of mixed wetland/upland shrub is located south of the project area along the banks of Bear Creek. An area of mixed wetland plants including reeds, rushes, sedges, and cattails is located south of the Leary Way/159th Place NE intersection. These plants appear to have been planted. Field observations confirmed that wetland soil and hydrologic conditions were not present in this area.

Environmental Impacts

Impacts Common to All Build Alternatives

Plants

The primary effect from construction of the Bear Creek Parkway Extension would be the removal and loss of habitat. The removal of upland forest and grassland disturbed/shrub communities in the project area would result in a net loss of habitat, causing the displacement of wildlife. Table 3.7 shows the quantity of upland forest

and grassland disturbed/shrub communities that would be impacted by the four build alternatives. This includes areas incorporated into the new wetponds proposed under each alternative. Only areas identified as upland forest or disturbed grassland/shrub on Figure 3.3 were included in the calculations.

**Table 3.7: Summary of Impacts on Vegetation Communities
(areas listed in acres)**

	Total Area	Upland Forest	Disturbed Grassland/Shrub
Alternative 1	3.31	0.11	3.20
Alternative 2	1.49	0.85	0.64
Alternative 3	1.39	0.86	0.53
Alternative 4	1.53	0.85	0.68

Animals

Clearing of native vegetation for roadway construction would eliminate and modify existing wildlife habitat. These impacts would displace and/or eliminate wildlife that currently depends on this vegetation. Use of heavy equipment during construction is expected to cause the greatest audible and visual disturbance to wildlife. Wider roads and new roadways would create additional barriers to wildlife movements by increasing the distance to travel between habitats, which can increase exposure to predators and vehicles or isolate wildlife that cannot traverse the new barriers. Additional pedestrian facilities may also impact wildlife in the project area, depending on the distance between these facilities and local habitats.

At this time, it is unknown how construction activity and/or increased traffic noise will impact the existing Blue Heron colony. The Redmond colony has chosen to nest in an area near a major roadway and near locations of human activity (e.g., the public market and the Workshop Tavern). Recent construction at Redmond Town Center (RTC) did not cause disruption to the herons (NWC, 2003). Although some alternatives are located closer to the nesting site than others and may have more potential for disturbance, it is not clear that roadway proximity would necessarily constitute an impact. Because construction will occur outside the primary breeding season (February 15 – May 15 or as determined through field observation), the Bear Creek Parkway Extension Project is not anticipated to have any adverse impacts to the colony.

Demolition of the King County maintenance facility buildings is scheduled for late 2004. If the herons are present at the nesting site during demolition, they will be monitored to determine whether the construction causes any disturbance or changed behavior. This information may be useful in determining whether roadway construction will adversely affect the colony.

Fish and Endangered Species

Each of the alternatives could result in temporary construction impacts on water quality in Sammamish River and Bear Creek, from increased erosion and

sedimentation. These potential impacts are not expected to be significant because required mitigation (Best Management Practices, as discussed in the *Earth* and *Water* sections) would prevent the transport of sediment to local waterways. Although it is unlikely, increased sedimentation from construction could reduce fish food availability and pool habitat area.

Water quality in the Sammamish River is not likely to be adversely impacted by any of the project alternatives. Erosion potential within the Sammamish River would not be affected due to its large size and slow velocity of water movement. Pollutants that are either dissolved or carried by runoff from pollution-generating impervious surfaces would be treated in accordance with the 2001 Department of Ecology *Stormwater Management Manual for Western Washington*. Water would be treated with a series of biofiltration swales, wet ponds, and/or other methods. Stormwater infiltration would be reviewed during design and utilized to the maximum extent allowable for the current soil conditions.

Because water quality is not expected to be adversely affected, there are no anticipated impacts on any of the listed or other fish species that occupy the Sammamish River and Bear Creek. However, construction of a new outfall to the Sammamish River will require a Hydraulic Project Approval (HPA) from the WDFW and a Section 404 permit from the US Army Corps of Engineers and a Redmond Shoreline Substantial Development Permit. Alternative 1 would require a Section 10 permit for construction over the Sammamish River. These permits require compliance with the federal Endangered Species Act. A full Biological Assessment will be prepared if required upon selection of a preferred alternative to ensure that no listed species are affected.

No Action Alternative

No vegetation would be lost under the No Action Alternative. Wildlife populations would not be affected.

Alternative 1

Plants

Alternative 1 would result in clearing 3.31 acres of vegetation, which is approximately twice as much total vegetation loss than in the other three build alternatives. However, Alternative 1 would disturb about half as much upland forest than Alternatives 2, 3, and 4. Alternative 1 would be significantly further from the heron colony's current nesting location than the other alternatives (approximately 500 west of the nesting area).

Almost all of the habitat that would be affected by Alternative 1 is disturbed grassland/shrub habitat (3.2 acres). The disturbed/shrub habitat offers lower habitat values for wildlife than less disturbed and more diverse forested areas. Alternative 1 would also result in the removal of 0.11 acres of upland forest. Significant and/or Landmark trees may be removed.

Animals

Coniferous forest and disturbed/shrub habitat removed during construction could affect areas currently used by wildlife, including herons. However, very few trees

within the Alternative 1 alignment provide suitable nesting size for herons. As described in the *Plants* section, disturbed grassland/shrub vegetation is the primary habitat that would be lost under this alignment. Loss of feeding habitat for Great Blue Heron and other local species would occur with this loss of local disturbed grassland/shrub vegetation under Alternative 1.

Fish and Endangered Species

Construction of the proposed bridge widening for Alternative 1 would involve shore work along the banks of the Sammamish River and work over the river in widening the Leary Way bridge. Because of the work near and over the river, Alternative 1 has the potential for increased erosion, sedimentation, and spills into the river. However, the work would not cause changes in channel hydraulic capacity that could alter stream hydraulics, channel morphology, or fish habitat. No new bridge supports or other structures would be located within the stream channel, and there would be no loss or alteration of local habitat.

Alternative 2

Plants

Alternative 2 would result in clearing 1.49 acres of vegetation, which is nearly identical to the total vegetation loss and type as in Alternatives 3 and 4, and approximately one-half as much area as in Alternative 1 (See Table 3.7 for vegetation loss in Alternatives 3 and 4). Alternative 2 would disturb primarily upland forest vegetation, and would be located within 100 feet of the current nesting location of the heron colony. Several large trees located at the northeast and southeast corner of Leary Way/162nd Ave NE would be taken by Alternative 2.

The majority of the habitat that would be affected by Alternative 2 is upland forest habitat (0.85 acres). Significant and/or Landmark trees may be removed. Alternative 2 would also result in the removal of disturbed grassland/shrub (0.64 acres). See Table 3.7 for similar area totals in Alternatives 3 and 4. The disturbed/shrub habitat offers lower habitat values for wildlife than less disturbed and more diverse forested areas.

Animals

Coniferous forest and disturbed/shrub habitat removed during construction could affect areas currently used by wildlife, including herons. Most trees within this alignment provide suitable nesting size and type for herons. As described in the *Plants* section, upland forest vegetation is the primary habitat that would be lost under this alignment.

Alternative 2 has the potential to impact the heron colony due to its proximity (within 100 feet) to the nesting site. Disturbance would include higher noise levels from temporary clearing and construction activities, and long-term traffic noise that would be adjacent to the current nesting location. This alignment would also create a more direct line of sight between the herons and the new roadway and pedestrian facilities. Because of a lack of documented studies of the effects of roadway construction and operation on heron colonies, it is unknown whether these conditions would result in a decline in heron nesting at its current location. However, given that the existing traffic noise on Leary Way, recent building construction at the RTC, and generally high

ambient noise from the nearby public market and Workshop Tavern (NWC 2003) have not affected the herons, it is not anticipated that Alternative 2 would cause long-term adverse impacts on the colony. Construction impacts may be better understood once the effects of the King County maintenance shop site demolition on the heron colony can be observed.

Fish and Endangered Species

No impacts to aquatic habitat, fish, or threatened and endangered species within the project area are anticipated under this project alignment.

Alternative 3

Plants

The impact of Alternative 3 on vegetation communities would be approximately the same as described for Alternative 2.

Animals

Wildlife impacts under Alternative 3 would be approximately the same as for Alternative 2. However, although the Alternative 3 alignment is adjacent to the existing heron colony, it does not follow the perimeter of the wooded area as closely as Alternative 2. Because Alternative 3 would leave more of the wooded area free from adjacent traffic, it may have fewer impacts. However, Alternative 3 still passes within 100 feet of the most recently documented nesting sites.

Fish and Endangered Species

Impacts on fish and threatened and endangered species for Alternative 3 would be the same as those described for Alternative 2.

Alternative 4

Plants

The impact of Alternative 4 on vegetation communities would be approximately the same as described for Alternative 2.

Animals

Wildlife impacts under Alternative 4 would be the same as for Alternative 2.

Fish and Endangered Species

Impacts on fish and threatened and endangered species for Alternative 4 would be the same as those described for Alternative 2.

Mitigation Measures

Plants

Redmond's Sensitive Areas Ordinance, general development requirements, clearing and grading code, and landscaping provisions would mitigate significant impacts on plant communities. These policies apply to new development and help protect the

City's natural habitats. The following specific mitigation measures would be implemented for all alternatives:

- Any disturbed area would be reseeded with an appropriate native species seed mix. Landscaping would emphasize the use of native plants.
- Tree loss would be minimized as much as possible. Any trees lost would be replaced on-site according to the City's Tree Protection regulations (CDG 20D.80.20). The area will be surveyed prior to construction to document the number and type of trees to be removed, if any.

The following mitigation measures could be considered to offset the effects of vegetation and habitat loss:

- The new wetponds and the reconfiguration of the existing wetponds under Alternative 1 could be constructed with slopes sufficiently gentle to encourage wildlife use.
- Additional shrub and tree vegetation could be planted along the Sammamish River and Bear Creek to reduce the invasive species and create better riverine habitat for wildlife and fish.

Animals

For all of the alternatives, mitigation measures implemented for potential impacts to animal resources would include:

- Construction shall not occur during the heron breeding season, February 15 through May 15 (or as determined through field observation, see Appendix B).
- Monitoring of herons during construction to note any disturbances to the colony caused by construction activity. See NWC (2003) for proposed monitoring procedures.
- Minimizing the number of trees removed, particularly those south of the existing colony, to minimize exposure of the colony to potential wind disturbances.
- Replacing trees lost near the heron nests with fast-growing species to minimize the temporal exposure of the colony to the open roadway (NWC 2003).
- Fencing and/or dense vegetation barriers between the new roadway and the heron colony may offset some of the disturbance effects (Quinn and Milner 1999).
- Additional surveys will be conducted prior to construction to identify the presence of raptors and other migratory birds and nests for compliance with the Migratory Bird Treaty Act and Redmond policies regarding protection of critical habitat (CDG 20D.140.10-070).
- Enhancement of the heron rookery parcel with the clearing of English ivy and Himalayan blackberry to allow more species diversity in the area. The large interior area currently filled with blackberry could be planted in later successional conifers like hemlock, as well as alder to provide an increase in community interspersions, forest vegetation layers and forage for band-tailed pigeon, another PHS species.
- Improving the suitability of nesting trees in the forest and in other areas away from the roadway. Selected trees could have branches cleared to allow flight access. Nest platforms could be placed in suitable trees.

Fish and Endangered Species

- Compliance with Endangered Species Act requirements will ensure that there are no adverse effects to the protected fish species in the project area.
- During construction, temporary erosion and sediment controls (TESCs) would be implemented in accordance with Volume II of the Ecology *Stormwater Management Manual for Western Washington* (Ecology, 2001). Best Management Practices (BMPs) to control the release of pollutants into surface water would be implemented during construction.
- Long-term water quality would be accomplished in accordance with Volume V of the Ecology *Stormwater Management Manual for Western Washington* (Ecology, 2001). BMPs for long-term water quality treatment would also be implemented and would include dispersion of flows, preservation of vegetation, biofiltration swales, and wet ponds.

Significant Unavoidable Adverse Impacts

Construction of the proposed alignments would result in the clearing of up to 2.61 acres, 1.23 acres, 1.18 acres, and 1.22 acres of vegetation and wildlife habitat under Alternatives 1, 2, 3, and 4, respectively. This translates to a direct loss of wildlife habitat and would cause some displacement and destruction of individual animals.

No significant unavoidable adverse impacts to fish or threatened or endangered species are expected.

Noise

The information provided in this section was obtained from document review, site inspections and field work conducted in the Bear Creek Parkway project area. In determining the proposed project's potential noise impacts, the following noise regulations and impact criteria were considered: Federal Highway Administration (FHWA) noise abatement criteria as adopted by the Washington State Department of Transportation (WSDOT), Washington State Department of Ecology (Ecology) noise level limits (WAC 173-60), and City of Redmond regulations to control environmental noise, which can be found in the CDG (20C.20.120). Redmond has adopted noise regulations that are consistent with Ecology's noise regulations.

Characteristics of Noise

Sound is created when objects vibrate, resulting in a minute variation in surrounding atmospheric pressure called *sound pressure*. Environmental noise is composed of many frequencies, each occurring simultaneously at its own sound pressure level. The range of magnitude, from the faintest to the loudest sound the ear can hear, is so large that sound pressure is expressed on a logarithmic scale in units called decibels (dB). Table 3.8 presents the magnitudes of typical noise levels.

Humans respond to a sound's frequency, or pitch. As measured by an electronic sound level meter, frequency weighting combines the sound frequencies into one sound level. The frequency weighting used for environmental noise is A-weighting (dBA), which simulates how an average person hears sounds.